

Me.; Puerto Principe, Cuba; Raleigh, N. C.; Richmond, Va.; Roseburg, Oreg.; Sacramento, Cal.; St. Paul, Minn.; Santa Fe, N. Mex.; Santiago de Cuba, W. I.; Savannah, Ga.; Scranton, Pa.; Shreveport, La.; Springfield, Ill.; Tacoma, Wash.; Toledo, Ohio; Valentine, Nebr.; Walla Walla, Wash.; Wiliston, N. Dak.; Wilmington, N. C.; Winnemucca, Nev.; Port of Spain, Trinidad; San Juan, P. R.; Currituck Inlet, N. C.; Roseau, Dominica, W. I.; Mount Tamalpais, Cal.; Astoria, Oreg.; Tacoma, Wash.; Yuma, Ariz.; Wichita, Kans.; Salt Lake City, Utah; Flagstaff, Ariz.; Amarillo, Tex.; Independence, Cal.; Point Reyes Light, Cal.; Miles City, Mont.; Twin, Wash.; Bridgetown, Barbados; Lewiston, Idaho; East Clallam, Wash.; Kingston, Jamaica.

The following stations report simply that explanations and instruction have been given to schools or visitors at the office of the observer:

R. L. Anderson, Observer, Hanover, Mo.; F. H. Clarke, Observer, Binghamton, N. Y.; Lee A. Denson, Observer, Meridian, Miss.; H. P. Dick, Observer, Kalispell, Mont.; George E. Franklin, Local Forecast Official, Los Angeles, Cal.; E. J. Glass, Section Director, Helena, Mont.; H. W. Grasse, Observer, Moorhead, Minn.; J. B. Marbury, Local Forecast Official, Atlanta, Ga.; E. H. Nimmo, Observer, Evansville, Ind.; U. G. Pursell, Observer, Sioux City, Iowa; Frank Ridgway, Local Forecast Official, Pittsburg, Pa.; G. N. Salisbury, Section Director, Seattle, Wash.; L. G. Schultz, Observer, Fort Worth, Tex.; L. M. Tarr, Observer, New Haven, Conn.; T. F. Townsend, Section Director, Philadelphia, Pa.; Lucius A. Welsh, Local Forecast Official, Omaha, Neb.; Alexander G. Burns, Observer, Sault Ste. Marie, Mich.; George W. Felger, Observer, Grand Haven, Mich.

Among those who report themselves as preparing to do more in the immediate future at schools, colleges, or universities, are the following:

R. G. Allen, Section Director, Ithaca, N. Y., where Prof. R. S. Tarr, of Cornell, gives his well known course in elementary meteorology two hours each week, and which students in forestry are required to attend; Edward A. Beals, Forecast Official and Section Director, Portland, Oreg., who will lecture on kite work at the University of Oregon; Allen Buell, Observer, San Antonio, Tex.; Thomas Crawford, Observer, Rapid City, S. Dak.; R. H. Dean, Observer, La Crosse, Wis.; George E. Franklin, Local Forecast Official, Los Angeles, Cal.; R. Q. Grant, Observer, Lexington, Ky.; G. A. Loveland, Section Director, Lincoln, Nebr.; A. J. Mitchell, Section Director, Jacksonville, Fla.; Orris W. Roberts, Observer, Yankton, S. Dak.; G. N. Salisbury, Section Director, Seattle, Wash.; P. H. Smyth, Observer, Cairo, Ill.; T. F. Townsend, Section Director, Philadelphia, Pa.; L. A. Welsh, Local Forecast Official, Omaha, Nebr.; A. G. McAdie, Forecast Official, San Francisco, Cal., who will lecture in the University of California; G. Reeder, Observer, Corpus Christi, Tex., who will lecture in the high school at that place.

Finally, the reports from fifteen stations are especially worthy of consideration. It appears that Messrs. A. F. Sims, Albany, N. Y.; O. L. Fassig, Baltimore, Md.; J. Warren Smith, Columbus, Ohio; T. B. Jennings, Topeka, Kans.; I. M. Cline, Galveston, Tex.; D. Cuthbertson, Buffalo, N. Y.; W. M. Fulton, Knoxville, Tenn.; R. Q. Grant, Lexington, Ky.; G. A. Loveland, Lincoln, Nebr.; A. G. McAdie, San Francisco, Cal.; George Reeder, Corpus Christi, Tex.; H. W. Richardson, Duluth, Minn., and Columbus, Ohio; W. A. Shaw, Northfield, Vt.; C. F. R. Wappenhans, Indianapolis, Ind., and possibly others, have delivered, or prepared to deliver, extended courses of instruction in meteorology, embracing from ten to forty lectures, and from one to five months of time to classes in normal schools, academies, colleges or universities. It is apparent from this that there are among the officials of the Weather Bureau some whose enthusiasm, taste,

and talent fit them for success in lecturing and teaching. If any college or university desires a special course of instruction in meteorology its attention would naturally be directed toward the above names, although doubtless many other men in the service will also show themselves qualified for such positions.

It has always been recognized that the utility, and sometimes even the very existence of the Weather Bureau, has depended upon the appreciation of the fact that meteorology is a branch of modern physical science. During the past thirty years there has been a campaign of instruction in this respect, and the work must necessarily go on for generations to come. Probably it would assist many of our observers to prepare lectures if they could have a reprint in one bulletin of the outlines of the courses of lectures already prepared by Messrs. O. L. Fassig, J. Warren Smith, I. M. Cline, W. M. Fulton, G. A. Loveland, A. G. McAdie, G. W. Shaw, T. B. Jennings, and perhaps others who have prepared such courses. The variety of treatment of the subject by these different individuals has undoubtedly been suggested by the peculiarities of climate, agriculture, and education in their respective localities, and their course of lectures will, therefore, offer something of the variety needed by other men in the service in preparing their own lectures. It is to be hoped that each lecturer will print or offer for printing a complete synopsis of his course so that other lecturers may profit by examining them.

MONTHLY STATEMENT OF AVERAGE WEATHER CONDITIONS.

The great desire for so-called long range predictions of climatic conditions, which in India is admirably responded to by the predictions of monsoon rains, can not, as yet, be gratified in a satisfactory manner for the United States, although it seems likely that we shall be able to do this before many years pass by. Meantime, in response to a popular demand, Professor Garriott, as Chief of the Forecast Division, has begun the preparation, for official publication, of a series of monthly statements of conditions observed during past years. The statement for August was published at the end of July, and is reprinted below.

This is not a weather prediction or forecast properly so-called, it simply tells us the averages and extremes that have occurred in past years, and leaves us to infer that probably something of the kind will happen during the present season. The individual months of the same name in successive years differ among themselves so much as to rainfall, temperature, cloudiness, and wind, that the average of a long series does not represent any one month, and in fact, is not that which is most likely to occur. A true prediction for a coming month must be based upon the study of the maps for the preceding six months, and must include the probable variations from the normal. In the absence of such precise predictions one may certainly draw some profit from a knowledge of the facts contained in these general statements.

AUGUST WEATHER.

STATEMENTS BASED ON CONDITIONS DETERMINED BY LONG OBSERVATION.

The following statements are based on average weather conditions for August, as determined by long series of observations. As the weather of any given August does not conform strictly to the average conditions the statements can not be considered as forecasts:

In August the weather on the North Atlantic Ocean is, as a rule, settled. The more severe storms, which occur on an average of about once in two years, are of tropical or subtropical origin, and cross the Grand Banks, traveling in a northeasterly direction. This course carries them north of the transatlantic steamship routes to the west of the

thirtieth meridian. The fogs of the Newfoundland banks are most prevalent in July and August, when they are encountered in that region twenty or more days in the month. The southern limit of icebergs on the banks, which reaches to about the fortieth parallel in June, contracts north of the forty-fifth parallel in August.

In the West Indies August marks the beginning of the hurricane season. The more severe storms of the month are, however, confined almost entirely to the more eastern islands of the West Indies, and any given locality in the Lesser Antilles and Porto Rico is subject to a hurricane visitation in August on an average of once in fifteen to twenty years. In the Gulf of Mexico the more severe storms of August pass west or north of west from the Caribbean Sea, and average about one in two years.

August is the month of maximum typhoon frequency in the Philippine Islands, the China Sea, and on the China and Japan coasts. These storms usually originate east or northeast of the Philippine Islands and move westward over the China Sea, or recurve northward to the China or Japan coasts. They compare in severity with the West Indian hurricanes.

In the United States August is a month of occasional thunderstorms from the Lake region and Ohio Valley, over the Middle Atlantic and New England States, and the rains in these districts, while usually of short duration, are at times excessive and attended by violent wind squalls. General storms of marked severity seldom occur on the Atlantic seaboard and the Great Lakes in August.

In the Southern States, east of the Mississippi River, the rainfall of the month is caused principally by minor disturbances, which advance from the Gulf of Mexico or the West Indies. Between the Mississippi River and the Rocky Mountains the month of August is usually dry and uneventful, with a tendency to strong and warm southwest winds.

Over the greater part of the country west of the Rocky Mountains, August rainfalls are light, and over the middle Plateau region and in California little or no rain falls.

WILLIS L. MOORE,
Chief U. S. Weather Bureau.

METEOROLOGICAL RECORDS IN OHIO.

We have received from Mr. Samuel P. Davidson, of London, Ohio, a copy of a very interesting climatological table pertaining to his station. Mr. Davidson has kept a record of the temperature and rainfall, dates of frost and other meteorological phenomena from 1852 to date. For thirty years of that time his thermometer was located in one and the same place. According to Mr. Davidson's record the present summer, in point of number of days with temperature of 90° and above, has been equaled once, and exceeded once, viz, in 1867 and 1854, when there were 30 and 38 days, respectively, with temperatures of 90° and above.

In response to Mr. Davidson's request for information as to other observers who have maintained a record for many years, we would say there are a number of voluntary meteorological observers in Ohio who have been reporting continuously for forty years and over. There may be other persons, as in the case of Mr. Davidson, who have made meteorological observations for many years.

Some of the oldest observers, in point of length of service, are mentioned below:

Mr. H. D. Gowey, of North Lewisburg, began making meteorological observations in 1852; he is still an active observer.

Mr. Gustavus A. Hyde, of Cleveland, Ohio, has been a voluntary observer about forty-five years. Mr. Hyde published a summary of his observations, privately, in 1896.

Prof. John Haywood, of Westerville, Ohio, has been observing continuously, if our record is correct, since 1858.

Dr. D. B. Cotton, of Portsmouth, Ohio, also began observations in the late fifties. Our record is not conclusive as to the date of Dr. Cotton's first report. He has likewise observed continuously to the present time.

Among others who have observed long and faithfully are Dr. J. B. Owsley, the present voluntary observer at Jacksonboro, Ohio (1868). Mr. Thomas Mikesell, Wauseon, Ohio (1870).

The Commonwealth of Ohio is fortunate in having within its limits an unusually large number of persons who have been observing the weather for many years.—A. J. H.

CLIMATOLOGICAL ATLAS OF THE RUSSIAN EMPIRE.

As a memorial volume commemorating the fiftieth anniversary of the foundation of the Central Physical Observatory founded by the Emperor Nicholas I on April 1, 1849, the present director general, M. Rykatcheff, has published a magnificent folio atlas, in which, by means of eighty-nine meteorological charts and fifteen graphical tables, he has presented the prominent features of the climate of the Russian Empire from Warsaw, on the extreme west, to Bering Strait, on the east, and from Teheran, on the south, to the Arctic Ocean on the north. This range of forty degrees in latitude and a hundred and sixty in longitude represents one of the most extensive compact meteorological systems in the world, and although stations are rather scarce in the interior of Siberia, yet the data are sufficient to justify drawing isobars and isotherms over the whole area. The volume contains thirteen monthly and annual charts, showing the pressure and resultant winds; also similar sets of thirteen charts for the temperature, vapor tension, and relative humidity, respectively. The total precipitation, viz, rain and snow, is shown on five charts for the four seasons and the year; the number of days of rainfall or snowfall and the quantity of cloudiness are also shown by similar sets of five charts each. Additional to these main charts are the following: The annual amplitude of the monthly mean temperature of the air, viz, the difference between the monthly means for July and January; the absolute maxima, the absolute minima, and the absolute range or amplitude for the whole period. All temperatures are reduced to sea level by allowing for a diminution of one-half degree, Centigrade, per 100 meters of elevation. Two charts are devoted to showing the seasons, or the months of maximum and minimum precipitation, which items are of peculiar importance to vegetation, and two other charts to the seasons of maximum and minimum number of rainy days, and two others to the seasons of maximum and minimum cloudiness. These six charts are of special interest in connection with vegetation. Finally three charts show the opening and closing of the rivers with ice. One chart, No. 83, shows the number of days during which a layer of snow prevails on the surface of the ground; the region of maximum number of days (190) extends from Archangel east-southeastward to the Ural and beyond. From this region the number of days during which snow lies on the ground diminishes as we proceed southward until we reach 60 days on the northern shores of the Caspian Sea and 20 days on the northwestern shores of the Black Sea. Chart 84 gives the number of days with thunderstorms, the maximum being 20 at many places, but especially in a belt extending from Nijni-Novgorod and Kazan southwestward to the borders of Roumania. The last five charts show the paths of cyclones and the types of weather in Russia, in so far as this latter depends upon the position of areas of high and low pressure. Although the size of the atlas renders it rather cumbersome, yet the paper and press work being of the finest quality render the whole work a magnificent monument, illustrative of the activity of this great meteorological office.

THE INFLUENCE OF THE LAKES ON TEMPERATURE OF THE LAND.

Mr. John West James, voluntary observer at station, Riley, Ill. (post office address Marengo, Ill.), writes as follows:

Can you kindly inform me, why, so far in the interior of the continent as I am, the east wind is so cold in spring and nearly all summer? My station is 46 miles due west from Lake Michigan, and the